

— A BIOGENESIS —  
OR, THE FRANKENSTEIN EFFECT  
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**D**uring work on an electrical experiment, an astonished scientist found that he had accidentally created life. This is the story of what he discovered over 150 years ago—and more...

Throughout the 1940s and 1950s, science was busy trying to replicate the primitive pre-life conditions that were supposedly responsible for the early beginnings of life on this planet. In laboratories around the world, white-coated priests of this *religion nouveau* subjected their test tubes, containing a multitude of weird and wonderful concoctions, to heat and electric current, whilst muttering strange incantations with words like "amino acids" and "chromosomes" as they vainly tried to coax life from their primordial soups and stews.

However, there is a possibility that the answer to the question of the origin of life on Earth may have surfaced well over a hundred years previously in an old house in the English countryside.

Publication of successful experiments performed by a solitary experimenter around the 1830s was suppressed at the time, though two other researchers (one of them the electrical luminary Michael Faraday) later claimed similar results.

Andrew Crosse, in the year 1836, would have been known by his peers as "an electrician" or "a scientific amateur". This was the era of the birth of electrical science. The few newspapers extant at the time were glowing with reports of the marvellous experiments of Michael Faraday, of Ohm, Morse and other electricity pioneers.

According to his family and friends, Crosse was an honest and simple, God-fearing man. A small income from an "encumbered estate" ensured he was able to work virtually unhindered on his electrical experiments in his Quantock Hills home in the south of England. His passion was the then-little-known field of electricity that used electric current to generate crystals.

Local gossip would have it that he was in league with the Devil. People often

reported to the local constabulary, seeing eerie flashing lights and hearing weird crackling, hissing noises coming from Crosse's house during the night and well into the wee hours. It was this type of phenomenon that eventually earned Crosse the title, "the Thunder and Lightning Man".

During the autumn of 1837, Crosse was busy trying to synthesise crystals of silica by passing a continuous weak current from Leyden condensers and galvanic batteries through oxide of iron, whilst a fluid medium of silicate of potash and hydrochloric acid was allowed to seep gradually through the iron. (It is interesting to note that Dr Wilhelm Reich, during experiments in the 1930s and 1940s with substances he called "bion fluids", suggested that static electricity like that in Leyden jars was similar to, if not the same power as, his "orgone energy" which he believed was the "fundamental phenomenon of life".)

For two weeks, Crosse patiently awaited the results of the experiment. The formation of crystals as he had expected was not immediately forthcoming, but something much more unusual and unexpected began to occur. In his diary, Crosse described the results of his experiment:

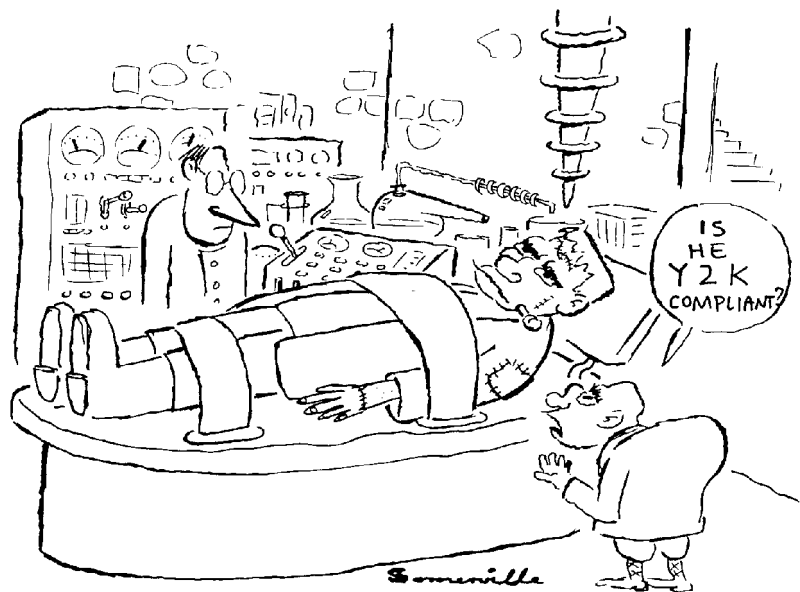
*On the fourteenth day from the*

*commencement of this experiment I observed through a lens a few small whitish excrescences or nipples, projecting from about the middle of the electrified stone. On the eighteenth day these projections enlarged, and struck out seven or eight filaments, each of them longer than the hemisphere on which they grew.*

There was nothing odd or different about this observation. Crosse had seen these "excrescences" on other occasions and knew them as merely preludes to the eventual formation of solid crystals.

*On the twenty-sixth day these appearances assumed the form of a perfect insect, standing erect on a few bristles which formed its tail. Till this period I had no notion that these appearances were other than an incipient mineral formation. On the twenty-eighth day these little creatures moved their legs. I must now say that I was not a little astonished. After a few days they detached themselves from the stone, and moved about at pleasure.*

Crosse continued monitoring the experiment, and in the course of a few weeks about a hundred of the creatures made their appearance on the stone. He examined



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them with a microscope and observed that the smaller ones appeared to have only six legs, the larger ones eight.

Crosse was unsure exactly what he had discovered:

*These insects are pronounced to be of the genus Acarus, but there appears to be a difference of opinion as to whether they are of a known species; some assert that they are not.*

Although an amateur, Crosse was no fool and began to suspect that his equipment had somehow become contaminated with the eggs of ordinary *Acari*. After a thorough examination of his equipment and the room, Crosse was satisfied that there could have been no contamination from any source, either airborne or otherwise. However, being the keen and conscientious investigator that he was, he determined in future to take steps to ensure that contamination would never be a problem.

Crosse by now had lost interest in his original experiments of generating crystals, and began preparations to conduct further experimentation in this new, exciting field.

In that same year, Crosse wrote two papers on his experiments. One was published in *Transactions of the London Electrical Society* (1838), and the other in *Annals of Electricity* (Oct 1836–Oct 1837).

As news of his discovery spread, the local people, mostly simple villagers and farm folk, were convinced that Crosse was

either mad or possessed, and by the year's end he had been damned from one end of England to the other. He was frequently insulted, and many unkindly referred to him as "a blasphemer" and "a reviler of our holy religion", while, conversely, a very small number hailed him as "a modern Prometheus".

Mary Shelley's novel, *Frankenstein*, had been released nearly 20 years earlier, and

Some days afterwards, these filaments become legs and bristles and a perfect *Acarus electricus* is the result.

Crosse's detractors now compared him to the book's mad scientist who managed to "electrically create life".

Somewhat unnerved at this personal form of attack, Crosse wrote to a colleague in complaint:

*I met with so much virulence and abuse...in consequence of the experiments that it seemed as if it were a crime to have made them."*

Crosse was relieved when he heard that another amateur, a Mr Weeks from

Sandwich, had successfully repeated some of his experiments but had used even more stringent precautions to prevent contamination.

Before commencing work, Weeks baked all his equipment in an oven at high temperatures, used only distilled water, filled his receivers over mercury troughs using "manufactured air" (oxygen), and even heated his silicate solutions strongly. After a year and a half of electrification, the *Acari* made their appearance. Control experiments, using everything except electricity, always failed; no *Acari* appeared.

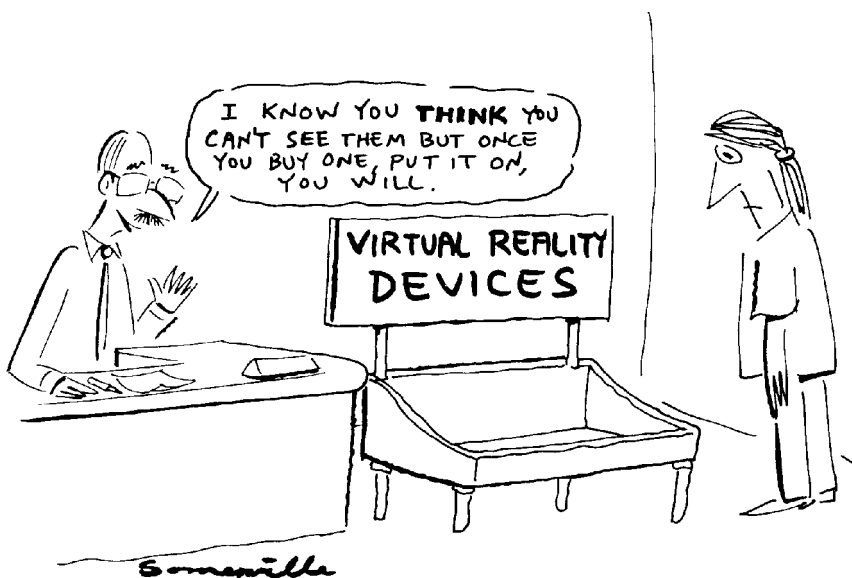
Weeks submitted a summary of his results to the Electrical Society, but, as it appears now, even less is known about this amateur than is known about Crosse.

Somewhat heartened, Crosse returned to his work with renewed vigour. Becoming more innovative, he dispensed with the electrified porous stone and began using glass cylinders or tubes filled with concentrated solutions of copper nitrate, copper sulphate and zinc sulphate. The *Acari* again made their appearance, though this time at the edge and two inches below the fluid surface. Remarkably, he found that after they emerged from the solution, if by accident they fell back into the liquid they were "destroyed".

Now this is very intriguing. Zinc sulphate, like all zinc compounds, is very poisonous, and copper sulphate and copper nitrate are used in insecticides. Apparently the *Acari* womb is also the *Acari* tomb! It seems incredible that they are born in this fluid and yet cannot return to it!

Crosse next used an even stronger substance, hydrofluoric acid—an acid so strong it was often stored in wax-lined bottles because of its tendency to dissolve glass. A small piece of quartz was immersed in the acid which contained silica in solution ( $H_2SiF_6$ ) to a depth of two inches. This quartz was kept "negatively electrified" and, after a period of more than 12 months, three *Acari* became visible on the piece of quartz.

Crosse's next experiment required the use of a hot silicate solution, prepared the same as for the first experiment. This time he used an hermetically sealed vessel. Upon connecting up the battery, he noticed that oxygen and hydrogen gases were being liberated, and on the 140th day he saw one of the tiny creatures crawling about within



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the retort. At this point, Crosse realised he had forgotten to place in the retort a resting place for the insect, and before long it fell back into the acid and disappeared! He expressed his amazement that in a solution so caustic, a creature could be born!

Crosse thoughtfully summarised his observations of his previous experiments with the *Acari*. He found that:

- The first appearance of the *Acari* consists in "a very minute whitish hemisphere" which forms upon the surface of the electrified substance. Sometimes it appears at the positive end and sometimes at the negative, occasionally between the two or in the middle of the electrified current, and sometimes upon all.

- After a few days, the speck enlarges and begins to elongate vertically and begins shooting out filaments of a whitish wavy appearance, which can be easily seen through a lens of very low power.

- Then begins the first appearance of life. If a sharp point is placed near these filaments, says Crosse, they immediately shrink up and collapse "like zoophytes upon moss", but expand again after its removal.

- Some days afterwards, these filaments become legs and bristles and a perfect *Acarus electricus* is the result. It finally detaches itself from its birthplace, and if under the fluid it climbs up the electrified wire and eventually escapes from the vessel. If one of them is later thrown back into the fluid in which it was produced, it is immediately drowned.

Crosse also mentions never having heard of *Acari* being produced under a fluid, or of their ova throwing out filaments, or of ever having observed any ova previous to or during "electrisation, except when a number of these insects in a perfect state congregate, ova are produced."

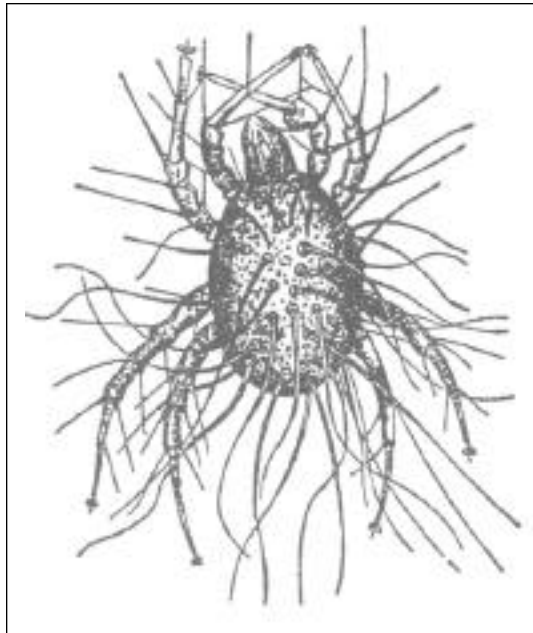
The only acknowledgement ever afforded to Crosse from the scientific establishment came in the form of a paper from Faraday, read at the Royal Institute. He stated that similar appearances had presented themselves during the course of his own experiments, but he was undecided whether they should be regarded as "a case of production or revivification".

Apparently the thin line between animal, mineral and vegetable can sometimes become a little blurred.

Another little-known pioneer of science who dared cross this line was the Indian

scientist Sir Jagadis Chandra Bose. Like Crosse, Bose did not fare well with the scientific academia and much of his work was ignored and disregarded. This was the same man who, in 1895, held a scientific demonstration in the Calcutta town hall, presided over by the Lieutenant-Governor of Bengal, Sir Alexander Mackenzie.

During this demonstration, Bose, with his "metallic coherer", transmitted radio waves from the lecture hall through several intervening walls to another room, a total of 75 feet away, where a relay was tripped,



*Acarus electricus* (not to scale), from a drawing in H. M. Noad's *Lectures on Electricity* (London, 1849)

throwing a heavy iron ball into the air, a pistol was fired and a small mine was detonated. (All this happened while Marconi (the acknowledged discoverer of radio) was in Bologna, still trying to transmit electrical waves without wires. He would not be granted his patent for wire-less transmission of electric waves for at least another year.)

It was during work on his metallic coherer that Bose noticed that after prolonged use his coherer became less sensitive, but after a period of non-use it somehow rejuvenated itself. Bose commenced experiments into metal fatigue and eventually developed a device which he called a Crescograph. It was as brilliant in its use as it was in its simplicity. The mainstay of this instrument was a simple "optical lever": when some slight invisible movement was applied to one end, the other end

would reflect a light beam, by way of a small mirror, to a screen many yards away. The resultant movements of this focused beam would equal an amplification of movement in the order of "ten million magnifications".

Bose was able to show by his device how animals, plants and metals when subjected to external stimuli gave exactly the same reactions. When metals and plants were doused with chloroform and other stupefying drugs, their movements, amplified by the device, would exhibit similar reactions

to the effects of general anaesthesia normally exhibited in animal life. And when fire was introduced, both plant and mineral registered the trauma of pain, followed by, if kept in the flame, a sudden rapid shuddering, followed by the stillness or straight line of death! The subjects exhibited similar responses to poisons, acids and other excitation.

One wonders, in the light of all the above information, if the scientific establishment may have been a little premature in dismissing the theory of abiogenesis—the creation of life from non-living matter.

It would go a long way if someone were to try to duplicate some or all of the experiments performed by Crosse—which, if nothing else, would at least bring the matter to a conclusion one way or the other.

The last word, in all fairness, must go to Crosse:

*To create is to form a something out of nothing. To annihilate is to reduce that something to a nothing. Both of these, of course, can only be the attributes of the Almighty.*

Ironically Crosse, somewhat like his *Acari*, died in the same room where he was born. He died on 6 July 1855 at the age of seventy-one years.

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